

Contents

Dedication	v
Preface	xxxv
About the Author	xliii
Glossary of Symbols	xlvi
Useful Mathematical Symbols and Formulae for Economics	xlvii
Part I Introduction to Macroeconomics	1
1. Output, Unemployment, and the Basic Concepts	3
1.1 Introduction to Macroeconomics	3
1.1.1 The nature of macroeconomic analysis	3
<i>The classification of goods in macroeconomics</i>	4
<i>Closed economy versus open economy analysis</i>	4
<i>Short-run macroeconomic theories, growth theories and business cycle theories</i>	4
1.2 The Classification of Economic Agents and Markets in Short-Run Macroeconomic Models	4
Box 1.1: The Analytical Devices of the Short-Run Versus Long-Run Analysis	6
Real Time Concepts: The Short Term and the Long Term	6
1.3 Introduction to AD-AS Analysis	6
1.3.1 The supply of commodities	6
<i>The long-run (equilibrium) aggregate supply of commodities</i>	6
<i>The short-run aggregate supply of commodities</i>	7
1.3.2 The components of aggregate demand	8
1.3.3 The diagrammatic AD-AS analysis	8
<i>The possibility of disequilibrium in the economy</i>	8
<i>The actual aggregate supply of commodities</i>	9
<i>The impact of an increase in aggregate demand</i>	9
<i>The impact of an increase in the long-run productive capacity of the economy</i>	10
<i>The stability of equilibrium</i>	10

1.4	The Relationship between Output, Employment, and Unemployment in the Economy . . .	10
	<i>The labor force</i>	11
	<i>Unemployment</i>	11
1.5	Measures of National Output and Expenditures	12
1.5.1	Gross domestic product (GDP)	12
	Fact Sheet 1.1: Global Trends in GDP Per Capita, 1950–2003	13
1.5.2	Gross national product (GNP)	13
1.5.3	Net domestic product (NDP) and net national product (NNP)	14
	Fact Sheet 1.2: Comparing GDP and GNP, 1965–2004	14
1.5.4	Measuring GDP	14
	Box 1.2: GDP per capita as a Measure of the Standard of Living	17
	GDP as a Measure of Welfare	18
1.6	Measuring the Price Level and the Rate of Inflation	18
1.6.1	Measures of the price level	18
1.6.2	The inflation rate	19
	Fact Sheet 1.3: Inflation in Canada, 1915–2007	20
1.6.3	Core inflation	20
	Mathematical Box 1.1: Calculation of the Price Index and Growth Rates	21
	The construction of a price index: an illustration	21
	Differences between Laspeyres and Paasche indices	22
	Separating the rate of growth of nominal income into the real growth rate and the inflation rate	22
1.6.4	Deriving the rate of inflation from a price index	24
	Box 1.3: Mathematical Formulae to Learn	24
	Fact Sheet 1.4: Measures of Inflation for the USA, 1960–2007	25
1.6.5	Disinflation versus deflation	25
1.7	Nominal Versus Real Output	26
1.8	The Economic Relationship between Real Output and Inflation	26
1.9	The Nature of Economic Relationships	27
	Box 1.4: Definition of Equilibrium	27
	Equilibrium conditions versus identities	27
	Equilibrium versus disequilibrium	28
	Stable versus unstable equilibrium	28
1.10	Exogenous and Endogenous Variables and the Concept of Shocks in Macroeconomics	28
1.10.1	An illustration	29
1.10.2	Shocks	29
1.10.3	Multipliers	29

1.11	Growth Theory	30
1.11.1	Growth of the standard of living	30
1.12	Business Cycle Theories	30
	Fact Sheet 1.5: Booms and Recessions in the USA Since 1960	31
	Box 1.5: The Fundamental Role of Economics as a Science	32
	Theories/models in economics	33
	Economics as the ‘premier social science’	33
1.13	Paradigms in Macroeconomics	33
1.14	Economic and Political Systems: Organization of the Macroeconomy	34
1.14.1	Capitalism	34
1.14.2	Marxism and communism	34
1.14.3	Socialism	35
1.15	Conclusions	35
	Key Concepts	36
	Critical Conclusions	36
	Review and Discussion Questions	37
	Advanced and Technical Questions	38
2.	Money, Prices, Interest Rates, and Fiscal Deficits	41
2.1	What Is Money and What Does It Do?	41
2.1.1	The functions of money	41
2.1.2	The practical definitions of money	42
2.2	Money Supply and Money Stock	42
2.3	The Nominal Versus the Real Value of the Money Supply	43
2.4	Bonds and Stocks in Macroeconomics	44
2.5	The Definition of the Money Market in Macroeconomics	44
2.6	A Brief History of the Definition of Money	45
2.7	The Current Definitions of Money and Related Concepts	46
	Extended Analysis Box 2.1: Current Meanings of the Symbols for the Monetary Aggregates in Selected Countries	46
	The monetary aggregates for USA	46
	The monetary aggregates for the Canada	46
	The monetary aggregates for the UK	47
	Fact Sheet 2.1: Monetary Aggregates of the USA	47
2.8	The Monetary Base and Bank Reserves	48
2.8.1	The relationship between the monetary base and the money supply	49
2.9	The Quantity Equation	49
2.9.1	The quantity equation in growth rates	50
2.9.2	The implications of the quantity equation for a persistently high inflation rate	50
	Fact Sheet 2.2: Money Growth and Inflation in the USA, 1960–2008	51

2.10	The Quantity Theory	51
	Extended Analysis Box 2.2: The Difference between the Quantity Theory and the Quantity Equation	52
2.10.1	The transactions approach to the quantity theory	52
	<i>The adjustment period relevant to the quantity theory</i>	53
	<i>Is velocity constant over time?</i>	53
	Fact Sheet 2.3: Velocity of Money in the USA, 1960–2008	54
2.11	The Definitions of Monetary and Fiscal Policies	54
2.12	The Central Bank and Monetary Policy	55
2.13	The Economic Aspects of the Government and Fiscal Policy	55
2.13.1	The financing of fiscal deficits/surpluses and changes in the money supply	56
	<i>The implications of the independence of the central bank from the government for financing deficits</i>	57
2.13.2	The public debt	57
2.13.3	The selective nature of government expenditures, taxes, and subsidies	58
2.14	Interest Rates in the Economy	58
2.14.1	The Fisher equation on interest rates	58
	Fact Sheet 2.4: Nominal and Real Interest Rates in the USA, 1982–2008	60
2.14.2	The concept of present discounted value (PDV) of a bond	61
2.14.3	Bubbles in asset prices	62
	<i>The importance of asset bubbles for output and business cycles</i>	62
	Box 2.1: The Determination of Stock Prices	63
	Bubbles in house and land prices	63
	A bubble in tulip bulb prices!	63
	Conclusions	64
	Key Concepts	65
	Summary of Critical Conclusions	65
	Review and Discussion Questions	65
	Advanced and Technical Questions	66
3.	Introduction to the Open Economy: Exchange Rates and the Balance of Payments	67
3.1	Exchange Rates	68
3.1.1	Three concepts of exchange rates	68
	<i>The (nominal) exchange rate</i>	68
	<i>The real exchange rate</i>	68
	<i>The effective exchange rate</i>	69
3.2	Fixed, Flexible, and Managed Exchanged Rates	70
3.3	Purchasing Power Parity (PPP) as a Theory of the Exchange Rate	70
3.3.1	PPP at the level of a single commodity	70
	<i>Absolute PPP among countries</i>	71
	Extended Analysis Box 3.1: Does PPP Apply in the Real World? An Illustration	71

3.4	Relative PPP and Shifts in the Relative Efficiency of Economies	72
3.4.1	Long-run changes in relative PPP	73
3.4.2	Short-run changes in relative PPP	74
3.4.3	Implications of short-run PPP for exchange rates and inflation rates	74
	Box 3.1: International Comparisons of Standards of Living in Terms of PPP	74
3.5	Interest Rate Parity (IRP) and the Determination of the Exchange Rate	76
3.5.1	The benchmark IRP theory	76
3.5.2	The benchmark IRP as a determinant of the domestic interest rate	77
3.5.3	The benchmark IRP as a theory of the exchange rate under flexible exchange rates	77
3.5.4	The role of speculative returns to stocks in capital flows and IRP	78
3.5.5	Extending IRP to incorporate risk factors and risk aversion	78
	Fact Sheet 3.1: Interest Rate Differentials Between Countries	79
3.5.6	The relative importance of PPP and IRP in determining exchange rates	79
3.6	The Balance of Payments	80
3.6.1	The components of the balance of payments	82
	Fact Sheet 3.2: United States Balance of Payments, 1976–2008	82
3.6.2	Equilibrium in the balance of payments	83
3.6.3	The change in foreign exchange reserves	84
	Fact Sheet 3.3: US Foreign Exchange Reserves and Balance of Payments, 2005–2008	84
	<i>Equilibrium in the balance of payments</i>	84
	<i>Foreign exchange reserves and short-term bonds</i>	85
3.7	The Balance of Payments in an Accounting Sense	85
3.8	The Market for Foreign Exchange and the Changes in Foreign Exchange Reserves	86
3.8.1	The demand and supply of foreign exchange	86
3.8.2	Equilibrium in the foreign exchange market	87
	Extended Analysis Box 3.2: The Demand and Supply of Foreign Exchange Stated in Foreign Currencies	87
3.9	The Market Determination of the Nominal Exchange Rate	88
	Fact Sheet 3.4: Exchange Rates against the US Dollar, 1980–2008	89
3.9.1	Hot money	89
	Box 3.2: National Policies on the Balance of Payments and Accumulation of Foreign Exchange Reserves	89
3.10	The Persistence of Balance of Payments Deficits and Surpluses	90
	Conclusions	90
	Key Concepts	91

Summary of Critical Conclusions 91

 Extended Analysis Box 3.1.A: Comparison of the Actual and PPP Costs of the Big
 Mac 91

Review and Discussion Questions 92

Advanced and Technical Questions 92

Part II Short-run Macroeconomics 95

4. Determinants of Aggregate Demand: The Commodity Market of the Closed Economy 97

 4.1 Symbols Used 97

 4.2 The Commodity Sector of the Closed Economy 97

 4.2.1 Uses of national income 97

 4.2.2 Sources of national expenditures 99

 4.2.3 Equilibrium in the commodity market 99

 4.2.4 National saving 99

 4.2.5 The relationship between saving and investment 100

 4.2.6 The (physical) capital stock 100

 Box 4.1: An Unjustified Oversimplification for a Modern Economy 101

 4.3 The Two Uses of Private Saving and the Drag of Deficits on Investment 101

 4.4 Disequilibrium and the Role of Changes in Inventories in the Adjustment
 to Equilibrium 102

 4.4.1 The role of unintended changes in inventories 103

 Extended Analysis Box 4.1: A Simplified Diagrammatic Analysis:
 The 45° Diagram 103

 4.4.2 Limitations of the 45° diagram for macroeconomic analysis 105

 4.5 For the Macroeconomic Analysis of the Closed Economy, Is There a
 National Income Identity and One Between National Saving and Investment? 105

 4.5.1 An accounting national income identity 105

 Extended Analysis Box 4.2: The Distinction Between the Meanings
 of Investment in Macroeconomics 106

 The actual change in the capital stock and the
 definitions of investment 107

 4.6 Demand Behavior in the Commodity Market 107

 4.6.1 Consumption expenditures 107

 Fact Sheet 4.1: Consumption and Disposable Income in the USA, 1980–2008 . . 109

 Fact Sheet 4.2: Interest Rates and Saving in the USA, 1985–2008 110

 4.6.2 The saving function 109

 Extended Analysis Box 4.3: The Dependence of Consumption
 on Wealth, Interest Rates 111

	The concept of lifetime wealth as the present discounted value of future incomes	111
4.6.3	Investment expenditures	113
4.6.4	Government expenditures and tax revenues	115
	Fact Sheet 4.3: Interest Rates and Investment in the USA, 1960–2008	114
	Extended Analysis Box 4.4: A more Realistic Investment Function	115
	The impact of business confidence on investment	115
	Fact Sheet 4.4: USA Fiscal Deficit, 1962–2008	117
4.6.5	The commodity market and the price level	118
4.7	The Commodity Market Model: The IS Equation/Curve	118
	<i>The impact of investment fluctuations on income: a partial investment multiplier</i>	119
	Box 4.2: The Mechanism of the Investment Multiplier: An Illustration	120
	<i>The impact of fiscal policy on income: partial fiscal policy multipliers</i>	120
	Box 4.3: The Impact of a Balanced Budget: The Balanced Budget Multiplier	121
	<i>A word of caution on IS multipliers</i>	121
	<i>The IS curve</i>	122
	<i>Shifts in the IS curve versus movements along it</i>	122
	Extended Analysis Box 4.5: The Slope of the IS Curve	123
4.8	Conclusions	124
	Key Concepts	124
	Summary of Critical Conclusions	124
	Review and Discussion Questions	124
	Advanced and Technical Questions	125
5.	Aggregate Demand in the Open Economy under an Interest Rate Target: Is-IRT Analysis	127
5.1	The Number of Goods and Markets in the Open Economy	127
5.2	The Foreign Exchange Sector of the Open Economy and the Balance of Payments, Review	128
5.2.1	Net interest payments and net transfer payments	130
5.2.2	Relationship between nominal and real interest rates	130
5.3	The Commodity Market of the Open Economy	130
	Fact Sheet 5.1: Components of Aggregate Demand for USA, Canada, and Thailand, 2007	132
5.3.1	The uses of private saving in the open economy	133

5.3.2	Three gaps: saving, fiscal, and external	133
	Fact Sheet 5.2: The uses of private saving in the USA, 1980–2008	134
5.3.3	Commodity market equilibrium and capital flows	135
	Extended Analysis Box 5.1: Financing high levels of domestic investment during the development stages and foreign exchange crises	135
	Foreign exchange crises and debt forgiveness	136
5.3.4	The open economy IS relationship	137
	<i>The complete model of the commodity sector for the open economy</i>	138
	Box 5.1: Derivation of the Open Economy is Equation	139
5.3.5	The open economy IS curve	141
5.3.6	Shifts in the open economy IS curve	142
	Extended Analysis Box 5.2: The Mathematical Derivation of the Slope of the IS Curve	142
	Changes in the slope of the IS curve as the economy becomes more open	142
	Comparing the magnitudes of the fiscal multipliers for open economies	143
	The stability of aggregate demand in more open economies	143
5.3.7	The impact of exchange rate changes on the IS curve	143
5.4	The Formulation of Monetary Policy	145
	Box 5.2: Money Supply, the Stock of Money and Their Relationship with the Interest Rate	145
5.4.1	Monetary policy through interest rate targeting	146
5.4.2	Rules versus discretion in setting the target interest rate	147
5.4.3	Diagrammatic depiction of the interest rate target	148
5.5	The Determination of Aggregate Demand under Interest Rate Targeting	148
5.5.1	Diagrammatic derivation of the AD curve	149
5.5.2	The downward slope of the AD curve in the open economy under an exogenous interest rate target: a reiteration	150
5.6	The Policy Multipliers for the Open Economy Aggregate Demand	150
5.6.1	The impact of investment fluctuations on aggregate demand: the investment multiplier	150
5.6.2	The impact of fiscal policy on aggregate demand: the fiscal multipliers	151
5.6.3	The impact of monetary policy on aggregate demand: the target rate multiplier	151
5.6.4	The distribution of incomes, consumption patterns, and the size of the multiplier	151

5.6.5	The impact of exports on domestic aggregate demand	152
5.6.6	The lag in the impact of changes in the interest rate target	152
5.7	Diagrammatic Analysis of Fiscal and Monetary Policies	152
5.8	The IS, IRT Curves and the Determination of Output: A Caveat	153
5.9	But What about the Monetary Sector and Its Money Demand and Supply Functions?	153
5.9.1	The demand for money	153
5.9.2	Ensuring equilibrium in the money market under an interest rate target and the determination of the money supply	155
5.10	Managing Aggregate Demand in the Open Economy: Monetary and Fiscal Policies under Flexible Exchange Rates	155
5.10.1	The effectiveness of fiscal policy for the open economy under interest rate targeting	155
5.10.2	The effectiveness of monetary policy for the open economy under interest rate targeting	156
5.10.3	Limitations on the effectiveness of a policy of interest rate targeting	157
5.11	Internal Versus External Balance	157
	Extended Analysis Box 5.3: The Mundell–Fleming Model of the Open Economy	158
5.12	Conclusions	158
	Key Concepts	159
	Summary of Critical Conclusions	159
	Review and Discussion Questions	159
	Advanced and Technical Questions	160
6.	Aggregate Demand Under a Money Supply Operating Target: IS-LM Analysis	163
6.1	Monetary Policy	163
6.1.1	Reasons for choosing interest rate targeting over money supply targeting, or vice versa	164
	<i>Lags in the impact of money supply changes versus those of interest rate changes</i>	164
	<i>Instability of money demand</i>	164
	<i>The informal financial sector and black money in developing economies</i>	164
6.1.2	Choosing the monetary aggregate as the target variable	165
6.2	The Demand for Money	166
6.3	The Motives for Holding Money	167
6.3.1	The volatility of the speculative demand for money	168
6.3.2	Other reasons for the volatility of the demand for money	168
6.4	The Standard Money Demand Function	168
	Extended Analysis Box 6.1: Special Cases of Money Demand	169
6.4.1	Equilibrium in the money market	171
	<i>Disequilibrium in the money market</i>	171
6.5	The LM Equation	172
6.5.1	The LM curve	172

6.5.2	Shifts in the LM curve	172
6.5.3	Shifts in the LM curve versus movements along it	174
6.5.4	Final comments on the LM curve	174
	Extended Analysis Box 6.2: The potential general shape of the LM curve	174
6.6	Deriving the Aggregate Demand for Commodities by Combining the IS and LM Curves	175
6.6.1	The IS equation for the commodity market equilibrium	175
6.6.2	The relationship between the nominal and real interest rates	175
6.6.3	Diagrammatic determination of aggregate demand	176
	<i>The IS, LM curves and the determination of output: a caveat</i>	177
6.7	The Impact of Expansionary Monetary and Fiscal Policies on Aggregate Demand	177
6.8	Bringing Aggregate Supply into the Open Economy Analysis, a Preview of Chapters 7 to 9	178
6.8.1	The impact of an increase in aggregate demand on the quantity supplied and the price level	178
6.8.2	The impact of monetary and fiscal policies on equilibrium output and price level in the open economy	178
	<i>The short-run impact of aggregate demand changes on output and the price level</i>	179
	<i>The long-run impact of aggregate demand changes on output and the price level</i>	179
6.8.3	Disequilibrium in the domestic economy and stabilization through monetary and fiscal policies	179
6.8.4	Summation on the roles of monetary and fiscal policies under flexible exchange rates	180
	Extended Analysis Box 6.3: The Mundell–Fleming Model of the Open Economy	180
6.9	The Central Bank’s Control Over the Money Supply	181
6.10	The Central Bank’s Instruments for Changing the Monetary Base	182
6.10.1	Open market operations	182
6.10.2	Shifting government deposits between the central bank and the commercial banks in Canada	182
6.10.3	A mechanism for commercial banks to change the monetary base	183
6.11	The Central Banks’ Control Over the Monetary Base <i>Multiplier</i> through Reserve Requirements	183
6.12	The Impact of Discount Rate Changes on the Economy	184
6.12.1	The central bank’s discount rate and interest rate differentials in the economy	184
6.13	The Determination of the Money Supply	184
	Extended Analysis Box 6.4: The Creation of Demand Deposits	185
6.14	A Common Money Supply Formula for <i>M1</i>	186
6.14.1	The monetary base multiplier	187
6.14.2	Numerical examples	188
6.15	Conclusions	188
	Key Concepts	188

Critical Conclusions	189
Appendix	189
Determination of the LM curve	189
Derivation of aggregate demand for the closed economy from its IS and LM equations	189
Intuition	190
Simplifying the AD equation for further analysis	191
Determination of the long-run <i>price level</i> under an exogenous money supply	191
Derivation of aggregate demand for the <i>open economy</i> from its IS and LM equations	191
Review and Discussion Questions	192
Advanced and Technical Questions	193
7. Full-Employment Output and the Natural Rate of Unemployment	195
7.1 The Production Function	196
Fact Sheet 7.1: Diminishing Marginal Product of Labor	197
Mathematical Box 7.1: Examples of Production Functions and the Derivation of the Marginal Product of Labor	198
The general procedure for deriving the MPL from the production function	198
7.2 The Labor Market	200
7.2.1 Demand for labor	200
<i>Diagrammatic analysis</i>	201
7.2.2 Supply of labor	201
Extended Analysis Box 7.1: The Intertemporal Analysis of Labor Supply	203
The Backward Bending Labor Supply Curve Over Long Periods	204
7.3 The Long-Run Equilibrium Levels of Employment and Output	205
7.3.1 The impact on long-run output of an increase in the price level or inflation rate	206
7.3.2 The diagrammatic analysis of employment and output	206
<i>The effect on output of an improvement in labor productivity</i>	206
7.3.3 The impact of aggregate demand on long-run output	206
<i>The pursuit of fiscal policies</i>	207
<i>The pursuit of expansionary monetary policies</i>	207
7.3.4 The ineffectiveness of monetary and fiscal policies in LR equilibrium	207
Mathematical Box 7.2: The Derivation of the Demand for Labor, Employment, and Output	207
The role of aggregate demand in determining output and the price level, an illustration	208
The impact of expansionary monetary and fiscal policies	209
7.4 The Effects of an Increase in the MPL on LR Output and Employment	209
7.4.1 Diagrammatic analysis of the impact of an improvement in technology on output and employment	210

7.5	The effects of an Increase in Labor Supply on LR Output, Employment and Price Level . . .	210
	Mathematical Box 7.3: The Effect of an Improvement in Technology	211
7.6	Conclusions on Changes in the Equilibrium Levels of Employment and Output	212
7.7	Full Employment and the Full-Employment Level of Output: Definitions and Conditions .	213
7.8	The Role of Supply-Side Policies in Changing Full-Employment Output	213
7.9	Stagflation	214
	Fact Sheet 7.2: The Price of Oil in the USA, 1960–2008	214
	Box 7.1: The Impact of Oil Price Shocks on Full Employment and Full-Employment Output in Oil Importing Countries	215
	The impact of oil price increases on oil producing countries	216
	Can expansionary monetary and fiscal policies eliminate this stagflation?	216
	Extended Analysis Box 7.2: The Role of Demand-Side Policies in Changing Full-Employment Output	216
	An implicit assumption in the above conclusions	217
7.10	Crowding Out of Investment by Fiscal Deficits, Given the LR Supply of Output in the Closed Economy	217
7.11	The Actual Level of Output in the Economy	218
	7.11.1 Changes in the actual rate of output over time	219
7.12	The Rate of Unemployment	219
	7.12.1 The LR equilibrium (natural) rate of unemployment	220
	<i>Shifts in the natural rate of unemployment</i>	220
	<i>The lack of impact of monetary and fiscal policies on the natural rate of unemployment</i>	221
7.13	The Long-Run Equilibrium (Natural) Rate of Interest	221
	<i>The ineffectiveness of monetary policy and inflation in changing the long-run real interest rate</i>	222
7.14	Conclusions	222
	Key Concepts	223
	Summary of Critical Conclusions	223
	Review and Discussion Questions	223
	Advanced and Technical Questions	224
8.	Output in the Short Run: The Role of Expectations and Adjustment Costs	227
8.1	The Role of Uncertainty and Errors in Expectations	228
	8.1.1 The theory of rational expectations	228
	8.1.2 Random errors and their predictability	229
	8.1.3 Application of rational expectations to monetary and fiscal policies	229
8.2	Price Expectations and the Labor Market: Output and Employment in the Context of Wage Contracts	229
	8.2.1 Labor supply in wage negotiations during the first stage	230
	8.2.2 Employment during the contract period (the production stage)	230

8.2.3	Diagrammatic analysis	231
	<i>The effect of a proportional increase in the expected and actual price levels</i>	232
	<i>Conclusions from the contract wage analysis of production</i>	232
	<i>The expectations augmented employment and output supply curves</i>	233
	<i>Implications of the expectations augmented employment and output supply equations for variations in employment and output over the business cycle</i>	233
	Box 8.1: Errors in Price Expectations, the Duration of the Wage Contract and Cost-of-Living Clauses	234
8.3	Friedman's Expectations Augmented Employment and Output Rules	234
	Extended Mathematical Analysis Box 8.1: Labor Demand when There are Expectational Errors in the Context of Nominal Wage Contracts	235
	The expectational equilibrium level of employment	236
	The impact of expectational errors on employment	236
	The Implications for Employment and Output of Wage Contracts with Expectational Errors in Prices	237
8.4	Lucas Supply Rule with Errors in Price Expectations in Commodity Markets	237
8.4.1	Firms' responses to errors in expectations	239
	Extended Analysis Box 8.2: Diagrammatic Analysis: Comparing the FSR and LSR Curves (FSR and LSR) and the LRAS Curve	239
8.5	The Implications of the FSR and LSR for the Impact of Anticipated Demand Increases	240
8.6	The Implications of the FSR and the LSR for the Impact of Unanticipated Demand Increases	241
8.6.1	The impact of revisions in anticipations and real time	241
8.6.2	Practical aspects of the FSR and LSR analysis	242
	Extended Analysis Box 8.3: The Implications of the FSR and LSR for the Impact of Monetary and Fiscal Policies	242
	The Implications of Rational Expectations for Systematic Monetary and Fiscal Policies	243
	The Scope for Monetary and Fiscal Policies for Stabilization when Private Demand is Volatile	244
	The Scope for Monetary Policies and the Political Economy of the Government's Budget	245
8.7	FSR and LSR: The Impact of Anticipated Permanent Supply Changes on the Economy	245

8.8	The Impact of Unanticipated but Permanent Supply Changes on the Economy	246
	Box 8.2: Cost of Living Clauses	247
8.9	The Short- and Long-Term Relationships between Output and Inflation	247
8.10	Empirical Validity of the FSR and the LSR	248
8.11	Types of Adjustment Costs and Their Impact on Output	248
8.11.1	Firms' responses to increases in the demand for their products	249
8.12	Menu Costs and Price Stickiness as the Explanation of the SRAS Curve	249
8.12.1	Aggregate supply in the sticky-price hypothesis	251
8.12.2	Monetary policy and the sticky-price SRAS curve	252
8.13	Costs of Adjusting Employment: Implicit Contracts as an Explanation of the SRAS Curve	252
8.13.1	Variations in work effort over the short term	253
	Box 8.3: Work Effort in Restaurants During the Day	253
	Work Effort by Students over the Term and the Calendar Year	253
8.13.2	The Flexibility of the Employment–Output Nexus in the Short Term	254
	<i>Long-term labor contracts and labor hoarding</i>	254
8.13.3	Okun's Rule: The Relationship between Unemployment and Output Changes	255
8.14	The Implications of Adjustment Costs for Persistence of Output and Employment Fluctuations Over the Business Cycle	256
8.15	Implications of Adjustment Costs for the Impact of Monetary and Fiscal Policies	257
8.16	Stagflation and the Recessions of 1973–1975 and 1980	257
	Box 8.4: Empirical Evidence on Price Changes, Wage Contracts and Output Response	257
8.17	Stylized Facts and Intuition on the Theories Explaining Variations in Output	258
8.18	Conclusions	259
	Key Concepts	260
	Summary of Critical Conclusions	260
	Review and Discussion Questions	261
	Advanced and Technical Questions	263
9.	Actual Output, Disequilibrium, and the Interaction among Markets	267
	Fact Sheet 9.1: Money Growth and Output Growth in USA, 1960–2008	269
9.1	The Relevance of Expectations on Variables Other Than Prices	269
9.2	Shocks to Aggregate Demand and Supply	270
	<i>Examples of shocks to consumption</i>	270
	<i>Examples of shocks to investment and net exports</i>	271
	<i>Shocks to money demand and supply</i>	272
	<i>Shocks to the cost and availability of credit</i>	272
9.2.1	Shocks to the aggregate supply of commodities	272
9.3	An Analysis of the Disequilibrium Following a Demand Shock	273

9.3.1	The assumptions for disequilibrium analysis	273
	<i>Effective aggregate demand and supply</i>	273
	Extended Analysis Box 9.1: The Dynamics Required for the Maintenance of a Full-Employment Scenario	274
9.3.2	A plausible dynamic scenario	275
	<i>Initial effects of the emergence of a demand deficiency</i>	275
	<i>Secondary effects of the demand deficiency</i>	275
	<i>The transition from the old equilibrium to the new one</i>	275
	<i>Output-price adjustment function [Optional]</i>	276
	Box 9.1: The Nature and Critical Role of Expectations in Dynamic Adjustments .	276
9.4	Diagrammatic Analysis Following a Fall in Aggregate Demand	278
	<i>Effective demand for labor</i>	279
9.5	Disequilibrium with Flexible Prices and Wages	279
	Extended Analysis Box 9.2: The Relative Rapidity of Commodity Markets in Adjusting Prices versus those by Firms and Consumers in Adjusting Production, Employment, and Prices	279
	The failure or sluggishness of the labor market in adjusting nominal wages versus the faster responses of firms and workers in adjusting employment and consumption	280
9.6	If the Real-World, Real-Time Economy is not on its LRAS or SRAS Curve, Where will it be?	281
9.7	Can the Economy Get Stuck Below Full Employment?	281
	<i>Impact of the disequilibrium on the long run: hysteresis</i>	282
9.8	Optimal Monetary and Fiscal Policies for the Demand-Deficient Economy	282
	<i>The use of expansionary monetary policies</i>	282
	<i>Limits to the effectiveness of monetary policies in a demand-deficient recession</i>	283
	<i>The use of fiscal policy: increases in government expenditures and/or cuts in taxes</i>	283
	<i>The policy dilemma</i>	284
	Fact Sheet 9.2: Economies in Disequilibrium: USA During the Great Depression	284
	<i>Recapitulation of the roles of monetary and fiscal policies in a demand-deficient economy</i> . . .	286
	Extended Analysis Box 9.3: Disagreements Among Economists on the Appropriate Policies in Real Time for a Real-World Economy	287
9.9	Excess Demand ¹⁸ in the Economy and Appropriate Policies	287
9.10	<i>Asymmetry</i> in the Economy's Responses to Deficient and Excess Demand	288
9.11	An Analysis of Disequilibrium Following a <i>Supply Shock</i>	288

9.11.1	Supply shocks from labor productivity	288
	<i>The scope for monetary and fiscal policies</i>	289
	Box 9.2: Demand Shocks Emanating from Shifts in Long-Run Supply	290
9.11.2	The impact of a decline in credit supply on the effective supply of commodities	290
9.12	‘Crowding-Out’ or ‘Crowding-In’ of Investment by Fiscal Expenditures in a Demand-Deficient Economy?	291
9.13	Disequilibrium (Involuntary Unemployment) in the Labor Market due to a High Real Wage	291
	<i>Expansionary monetary policy as a means of lowering the real wage and restoring equilibrium in the labor market</i>	292
	Extended Analysis Box 9.4: Is the preceding demand-deficient analysis a reflection of market failure or of markets’ sluggishness in adjustment of prices and nominal wages?	293
9.14	The Dual Implications of a High Saving Rate	293
	<i>The paradox of a high saving rate — also known as the paradox of thrift</i>	293
9.15	Conclusions	294
	Key Concepts	295
	Summary of Critical Conclusions	295
	Review and Discussion Questions	296
	Advanced and Technical Questions	297
10.	Employment, Unemployment, and Inflation	301
10.1	Definitions of the Labor Force and Labor Supply	301
10.1.1	Frictional unemployment and actual employment in labor market equilibrium	302
	<i>The notions of matched labor supply and matched labor demand in the presence of frictional unemployment</i>	304
10.1.2	Discouraged workers	304
10.1.3	Other determinants of the equilibrium level of unemployment	305
	Box 10.1: The Labor Force Participation Rate	305
	The non-employment rate	306
	<i>Shifts in labor force participation rates in recent decades</i>	306
	Fact Sheet 10.1: Participation Rates in Canada and the United States, Male and Female, 1980–2008	307
10.2	The Components of Unemployment	307
	The diagrammatic depiction of the components of unemployment	308
10.3	Involuntary Unemployment	308
	<i>Involuntary unemployment due to a high real wage</i>	309
	<i>Involuntary unemployment due to the emergence of a demand deficiency</i>	309
	<i>Involuntary unemployment due to a credit crisis</i>	309

	<i>The variation in the number of discouraged workers with the state of the economy</i>	309
10.4	The Actual Rate of Unemployment	310
	Fact Sheet 10.2: Unemployment Rates in Selected Countries, 1985–2008	311
10.4.1	The division of unemployment into natural and cyclical unemployment	312
10.4.2	Changes in the actual rate of unemployment over time	313
	<i>Short-run and long-run variations in the natural rate of unemployment</i>	313
	Fact Sheet 10.4:	313
	<i>Estimating the natural rate of unemployment</i>	314
	Fact Sheet 10.5: Unemployment and Trend Unemployment in the United States, 1980–2008	314
10.5	Policies to Reduce Structural Unemployment	315
	Extended Analysis Box 10.1: Changes in Structural Unemployment	316
	The impact of fiscal and monetary policies on structural unemployment	316
10.6	Policies to Reduce Frictional Unemployment	317
10.7	Measuring Involuntary Unemployment	317
	<i>Two ways of measuring involuntary unemployment</i>	317
	<i>Monetary and fiscal policies to reduce involuntary unemployment</i>	318
	Box 10.2: Causes High Unemployment in Canada and Europe Relative to the USA	318
10.8	The Costs of Unemployment	319
10.9	Relationship Between Unemployment and the Inflation Rate from the AD-AS Analysis	320
10.10	Phillips Curve (PC)	321
	10.10.1 Use of the Phillips curve as a policy trade-off	322
	10.10.2 Instability of the Phillips' curve	322
10.11	Deviations of the SR Equilibrium Unemployment Rate from the Natural One	322
	Fact Sheet 10.6: Historical Phillips Curves in the United States, 1960–1995	323
	10.11.1 Friedman and the expectations augmented Phillips curve (EAPC)	323
	10.11.2 Expectational equilibrium and the natural rate	325
	Extended Analysis Box 10.2: The Friedman AND Lucas Supply Rules	325
	Expectational errors and the commodity markets: The Lucas supply rule	326
10.12	The Implications of the EAPC for Shifts in the Phillips Curve and for Policy	326
	<i>The relationship between the Phillips' curve and the EAPC</i>	327
10.13	The EAPC and the Non-Accelerating Inflation Rate of Unemployment	328
10.14	The Implications of the EAPC for the Impact of Anticipated and Unanticipated Demand Increases	328

10.15	The Determinants of Inflation	328
	Fact Sheet 10.7:	329
	<i>Another way of stating the determinants of inflation</i>	330
10.16	The Costs of Inflation	330
10.16.1	Inflation under perfect competition with fully anticipated inflation for all future periods: the costs of inflation in the analytical long-run case	330
	<i>An intermediate scenario: anticipated inflation in the commodity and labor markets for some quarters ahead</i>	332
10.16.2	The costs of unanticipated inflation	332
	<i>A caveat</i>	333
	Box 10.3: The Impact of Hyperinflation on Long-Term Output Growth and the Standard of Living: Practical Experience in Contrast to Theory	333
10.17	The Sacrifice Ratio	334
	Fact Sheet 10.8: Sacrifice Ratio in the United States, 1950–2008	334
10.17.1	Gradualist versus Cold Turkey Policies of Disinflation	334
10.17.2	Indexation to the rate of inflation: should nominal wages and interest rates be indexed?	335
10.18	Conclusions	335
	Key Concepts	337
	Summary of Critical Conclusions	337
	Review and Discussion Questions	338
	Advanced and Technical Questions	338
11.	Paradigms in Macroeconomics	341
	Stylized Facts on Money, Prices, and Output	342
11.1	An Analogy for the Two Main Paradigms in Macroeconomics	343
11.1.1	The approach of the classical paradigm to the pathology of the economy	344
11.1.2	The approach of the Keynesian paradigm to the pathology of the economy	344
	Extended Analysis Box 11.1: The Fundamental Assumptions of the Classical Paradigm	345
11.2	Defining and Demarcating the Models of the Classical Paradigm	346
11.2.1	The traditional classical approach	347
	Extended Analysis Box 11.2: The Founders of the Classical Tradition in Macroeconomics	348
	David Hume (1711–1776)	348
	Adam Smith (1723–1790)	348
	David Ricardo (1772–1823)	349

11.2.2	The neoclassical model	349
	Box 11.1: Some Major Misconceptions about Traditional Classical and Neoclassical Approaches in the Classical Paradigm	350
11.2.3	The 1970s monetarism	351
11.2.4	The modern classical model	352
11.2.5	The new classical model	353
	Extended Analysis Box 11.3: The Founders of the Classical Approach in the Modern Period	353
	Milton Friedman (1912–2006)	353
	Robert Lucas (1937–)	354
	Extended Analysis Box 11.4: The Economic Contributions of Milton Friedman	355
11.2.6	Milton Friedman and the Keynesians	355
11.2.7	The relationship between the Monetarists and Friedman	356
11.2.8	Friedman and the modern classical school	356
11.3	The Keynesian Paradigm	357
	Extended Analysis Box 11.5: The Founders of the Keynesian Paradigm	358
	Knut Wicksell (1851–1926)	358
	John Maynard Keynes (1883–1946)	358
11.3.1	Development of the Keynesian schools after Keynes	359
11.3.2	Frequent themes in the Keynesian paradigm	359
	<i>New Keynesian economics</i>	360
11.3.3	The variety of Keynesian models	360
	<i>Monetary and fiscal policy effects in Keynesian models</i>	361
11.3.4	The critical role of dynamic analysis when aggregate demand falls	361
	Box 11.2: The Keynesian-Neoclassical Synthesis on Aggregate Demand	362
11.4	The Reformulation of Keynesian Approaches	362
11.4.1	NeoKeynesian building blocks for the reformulation of Keynesian macroeconomics	362
11.4.2	Taylor rule and its incorporation into Keynesian macroeconomics	363
11.4.3	The new Keynesian model	363
11.5	The Credit and Economic Crisis of 2007–2010: Which Theory Can Explain It?	364
11.6	Which Macroeconomic Paradigm Should One Believe In and Use?	365
	Box 11.3: The Anatomy of Two Quite Different Recessions: 1973–1975 and 2001–2002	365
11.7	Paradigms and Policies	366
11.7.1	Stabilization versus pro-active policies	366
11.7.2	Rules versus discretion in the pursuit of policies	366
11.8	The Role of the Government in the Macroeconomy	366
11.8.1	Evolution of ideas about the role of the government	367

11.8.2	Classical and Keynesian approaches and the debates on the size of the government	368
11.9	Conclusions	368
	Keynesian versus classical economics in relation to the real world and real time	369
	Key Concepts	370
	Summary of Critical Conclusions	371
	Review and Discussion Questions	371
	Advanced and Technical Questions	372

Part III Topics in Open Economy Macroeconomics 373

12.	The Foreign Exchange Market, IMF, and Globalization	375
12.1	Review of PPP	376
12.2	Review of Interest Rate Parity (IRP) Theory	377
12.2.1	IRP as a theory of the interest rate	377
	<i>The importance of stock market returns for capital flows: a problem for the IRP theory</i>	378
	Fact Sheet 12.1: Interest Rate Differentials between Countries	378
	<i>Simplified form of the benchmark IRP for short-run analysis</i>	379
	<i>Covered versus uncovered IRP</i>	379
12.2.2	IRP as a theory of the exchange rate	380
	<i>The inconsistency between the IRP's implications and common observations</i>	381
12.2.3	The impact of expectations on exchange rates	382
12.3	PPP and IRP Combined	383
	<i>Long run analysis</i>	383
	<i>Short run analysis</i>	383
12.4	The Market for Foreign Exchange, a Review	384
	Fact Sheet 12.2: Interest Rates and Net Capital Flows in the USA, 1985–2008	386
12.4.1	The relationship between the balance of payments and $(D^{\$} - S^{\$})$	386
12.4.2	Diagrammatic analysis	386
12.5	Demand and Supply Elasticities	388
12.6	The J Curve for the Value of Net Exports in Real Time	388
12.6.1	Limitations of the commodity-based exchange market analysis	390
12.6.2	Policy implications of the J curve	390
	Extended Analysis Box 12.1: The General Experience of Industrialized Countries and LDCs on the J Curve	391
	Implications of the above analysis for movements of exchange rates under flexible exchange rates	391
12.7	Historical Experience with Flexible Versus Fixed Exchange Rates	392
12.8	Measures to Reduce Balance of Payments Deficits	393
12.9	The International Monetary Fund (IMF)	394

12.9.1	The IMF and disequilibrium in the balance of payments of the member countries	395
	Extended Analysis Box 12.2: IMF Conditionality	395
	For whose benefit are the IMF policies?	396
12.9.2	The IMF and capital flows	396
12.9.3	Special drawing rights (SDRs)	397
	Extended Analysis Box 12.3: The World's Demand for Liquidity	397
	Exchange and financial crises	398
	Is the IMF a central banker for the world?	398
	Does the world economy need a central bank?	399
	The rising demand for the IMF to create a world currency	399
12.10	The International Transmission of Crises and Business Cycles	400
12.11	Economic Globalization	400
12.11.1	Causes of the push for global markets	401
12.11.2	Measures of the extent of globalization	402
12.11.3	Other aspects of globalization	403
12.11.4	Globalization and modernization	403
12.11.5	The persistence of nationalistic mercantilism — globalization limited to truncated globalization	404
12.11.6	The possibility of net losses from globalization	405
12.11.7	Effects of globalization on commodity and capital flows	405
12.12	Conclusions	406
	Key Concepts	408
	Summary of Critical Conclusions	408
	Review and Discussion Questions	409
	Advanced and Technical Questions	409
13.	The Open Economy Under a Fixed Exchange Rate Regime	411
13.1	The Balance of Payments (BP) Equilibrium Curve Under Fixed Exchange Rates	411
13.2	The IS-LM Model for the Open Economy Under Fixed Exchange Rates	413
13.2.1	The slope of the BP curve	413
13.2.2	The relative slopes of the LM and BP curves	413
	Extended Analysis Box 13.1: Differences between the IS-LM Diagrams for the Flexible and Fixed Exchange Rates	414
13.2.3	General equilibrium under fixed exchange rates, a diagrammatic treatment	414
13.3	Managing Aggregate Demand in the Open Economy: Monetary and Fiscal Policies Under Fixed Exchange Rates	415
13.3.1	The impact of an expansionary fiscal policy on aggregate demand	416

13.3.2	The impact of an expansionary monetary policy on aggregate demand	416
	Extended Analysis Box 13.2: Monetary and Fiscal Policies in the Case of Interest–Insensitive Capital Flows and Fixed Exchange Rates	417
13.4	Bringing Aggregate Supply into the IS-LM Analysis with a Fixed Exchange Rate	418
13.5	Macroeconomic Equilibrium in the Small Open Economy with Full Employment and IRP	418
13.5.1	Fiscal policies under IRP and full employment	419
13.5.2	Monetary policy under IRP and full employment	419
13.6	PPP, the World Rate of Inflation and the Convergence in National Inflation Rates	420
13.6.1	The world rate of inflation in the fixed exchange rate case	420
	Box 13.1: The impact of a large economy on smaller economies	421
13.7	Economic Blocs, Fixed Exchange Rates and the Convergence in Inflation Rates	421
13.8	Disequilibrium in the Domestic Economy and Stabilization through Monetary and Fiscal Policies: The Fixed Exchange Rate Case with Interest Sensitive Capital Flows	421
	<i>A caveat</i>	422
	Extended Analysis Box 13.3: Disequilibrium in the Domestic Economy and Stabilization through Monetary and Fiscal Policies: The Fixed Exchange Rate Case with Interest Insensitive Capital Flows	422
13.9	The Need for Monetary and Fiscal Policies under Fixed Exchange Rates	423
13.9.1	Internal versus external balance	423
13.9.2	A note of caution on the use of monetary and fiscal policies	424
13.10	The Effect of Relatively Different Improvements in Productivity at Home and Abroad under Fixed Exchange Rates	424
13.11	The Political Economy of Exchange Rates: The Choice between Fixed and Flexible Exchange Rate Regimes	425
13.12	Other Tools for Handling Balance of Payments Deficits	426
	Extended Analysis Box 13.4: The Gold Standard and the Gold Exchange Standard	426
13.13	Summary of the Costs and Benefits of a Fixed Exchange Rate	428
13.14	Dollarization	429
13.14.1	Dollarization and different productivity growth rates	431
	Extended Analysis Box 13.5: A Dual Currency System: Dollarization Along with a Separate National Currency	431
13.15	Currency Boards	432
13.16	Conclusions	432
	Key Concepts	433
	Summary of Critical Conclusions	433

Review and Discussion Questions 434
 Advanced and Technical Questions 434

Part IV Growth Economics 437

14. Classical Growth Theory 439

Fact Sheet 14.1: Long-Term Real GDP Growth in Selected Countries,
 1960–2003 439

Fact Sheet 14.2: Real GDP Growth Rates in the USA 440

Extended Analysis Box 14.1: Setting the Boundaries of Macroeconomic
 Growth Theory 442

14.1 The Classical (Solow’s) Growth Model’s Assumptions 443

14.1.1 The technology of production 443

14.1.2 Saving, investment and the change in the capital stock 444

14.1.3 Labor force growth 445

14.2 The Analysis of the Solow Model 445

14.3 Diagrammatic Analysis of the Solow Model 446

14.3.1 The SS growth rate of output 447

Extended Analysis Box 14.2: Variability of the Saving Rate 448

14.3.2 The impact of shifts in the saving rate 448

Mathematical Box 14.1: Numerical example A 449

14.3.3 The impact of shifts in the labor force growth rate 450

Mathematical Box 14.2: Numerical example B 451

14.4 The Growth Implications of a More General Production Function 452

14.5 Convergence Versus Divergence in Output per capita among Countries 453

14.6 Assessing the Importance of Technical Change in the Solow Model¹⁶ 454

14.6.1 Solow’s estimates of the contribution of technical change to the improvement
 in living standards 457

Mathematical Box 14.3: Numerical Examples on Technical Change 457

14.6.2 The residual as the unexplained component of growth 458

Mathematical Box 14.4: Detailed Estimation of the Contributions
 to Economic Growth 458

Estimating the returns to different educational levels 458

14.7 Some Empirical Findings on the Contributions to Growth 461

14.8 The Solow Growth Model with Exogenous Changes in the Quality of Labor 461

14.8.1 Diagrammatic analysis 463

14.8.2	The role of human capital in changing the quality of labor	464
	Extended Analysis Box 14.3: The Variability of the Labor Force Growth Rate	465
14.8.3	Technical change with falling or negative labor force growth rates	465
14.8.4	Shifts in participation rates	466
	Fact Sheet 14.3: Participation Rates in Canada and the USA, Male and Female, 1980–2008	466
	Box 14.2: The Implications of Increases in the Labor Force Participation of Women	467
14.9	SS Growth versus Level Effects of Exogenous Shifts	468
14.10	The Implications of the Solow Analyses for Policy	468
	Fact Sheet 14.4: Real GDP Per Capita, 2003 Population Growth Rates	469
	Box 14.3: Historical Growth Patterns, Labor force Growth, and Technology Shifts	469
14.10.1	Malthus’s theory of economic growth and the Malthusian stage	471
14.10.2	The post-Malthusian stage	472
14.10.3	The modern growth stage	472
14.11	Conclusions	473
	Key Concepts	474
	Summary of Critical Conclusions	474
	Review and Discussion Questions	474
	Advanced and Technical Questions	475
15.	Advanced Topics in Growth Theory	481
15.1	Technology, Knowledge and Externalities	482
15.1.1	The distinction between endogenous and exogenous technical change	482
15.1.2	The definition of capital in endogenous growth theories	483
15.1.3	The externalities of new knowledge	483
	Box 15.1: Inventions, Innovations, and Patents	484
	Innovations versus inventions as forms of technical change	484
15.1.4	Patents and the protection of copyright, intellectual property and trade secrets	485
	<i>Recent changes in patent protection</i>	486
15.2	The Production of New Knowledge	486
15.2.1	Diagrammatic analysis	488
15.3	The Dissemination of Knowledge Across Countries	488
15.4	Diagrammatic Analysis	490
15.4.1	Growth rates and capital flows among countries	491
15.4.2	Convergence and divergence in living standards between countries	491

15.4.3	Continuous growth in the advanced economies	492
	Box 15.2: Foreign Aid and Investment — and Capital Drain	492
15.5	The Historical Experience of Growth	492
	Box 15.3: Economic Globalization and Endogenous Technical Change	493
	Technology Clusters	493
	Globalization and Patents	494
15.6	Human Capital	494
	Box 15.4: The Innovative Process and Its Creative Destruction	494
15.7	The Implications of Endogenous Growth Theories for Macroeconomic Policies	496
	Extended Analysis Box 15.1: International Linkages and Growth	497
15.8	The Importance of the Inflation Rate and the Quantity of Money for Growth	498
	Box 15.5: The Role of the Financial Sector in Growth: Some Conclusions from Economic History	499
15.9	The Role of the Financial Sector in Growth: Recent Empirical Evidence	500
15.10	The Miracle of Economic Growth	501
	15.10.1 The miracle of growth and financial crises in the economic tigers	501
	15.10.2 The economic crisis of 2007–2010 in the USA	501
	Extended Analysis Box 15.2: The Economic, Social, and Political Environment for Growth: Markets, Competition, Capitalism, and Entrepreneurship	502
15.11	Empirical Evidence on the Contributors to Growth	503
	15.11.1 Empirical evidence on growth in recent decades	504
15.12	Conclusions	505
	Conclusions from endogenous growth theory	505
	Conclusions on money, the financial sector, and growth	506
	Key Concepts	507
	Summary of Critical Conclusions	507
	Review and Discussion Questions	508
	Advanced and Technical Questions	508
16.	Business Cycles, Crises, and The International Transmission of Economic Activity	511
16.1	Recessions and Booms in Economic Activity	513
	16.1.1 The popular statistical designation of a recession	513
	16.1.2 Monetary and fiscal policies to combat a recession	514
	Fact Sheet 16.1: Output Gap in the United States (USA), 1980–2008	515
16.2	Business Cycles and the Growth Trend in Economic Activity	516
	Box 16.1: Eliminating the Trend from the Data	516
	Deriving the trend rate of output	516
	The unemployment rate as the proxy for the output gap	517

16.3	Stylized Facts of Business Cycles	517
16.4	The Behavior of Variables Over the Business Cycle	518
16.4.1	Procyclical, acyclical, and countercyclical movements	518
16.4.2	Leading, lagging, and coincident variables	518
16.4.3	The volatility of variables over time	519
16.5	Business Cycles, the Full Employment Assumption and the Classical and Keynesian Paradigms	519
	Box 16.2: Business Cycles and The Assumption of Full Employment	521
16.6	The General <i>AD–AS</i> Theory of Business Cycles	521
	Fact Sheet 16.2: The Structure of the <i>AD–AS</i> Model	523
16.6.1	The propagation mechanism	523
	Box 16.3: An Illustration of Technical Change Creating Cycles through Aggregate Demand Shifts	524
16.7	The Modern Classical Approach to Business Cycles	525
16.7.1	Real business cycle theory	526
16.7.2	Policy implications of the RBC theories	528
16.8	Keynesian Explanations of the Business Cycle	528
16.8.1	The multiplier-accelerator model of aggregate demand	529
16.8.2	Limitations of the validity of the multiplier–accelerator model	530
	Extended Analysis Box 16.1: A Taxonomy of the General Reasons for the Occurrence of Business Cycles	531
16.9	International Linkages Among National Business Cycles	532
16.9.1	A world business cycle	533
16.10	Crises in Economic Activity	533
	Fact Sheet 16.3: The Asian Crisis of the Mid-1990s	533
16.11	Long-Term Effects of Recessions and Booms	535
16.11.1	The accumulation of human capital	535
16.11.2	The accumulation of physical capital	536
16.11.3	Technical change	536
16.11.4	The longer-term effects of cyclical fluctuations through aggregate demand	536
16.11.5	The longer-term impact of recessions and booms	537
16.11.6	The implications of hysteresis for policy	537
16.12	Money, Credit and Business Cycles	538
16.12.1	Money supply and business cycles	538
16.12.2	Credit and business cycles	538
16.12.3	Economic crises	540
16.12.4	Some instances of financial crises	540

16.13	The Relevance of Monetary and Fiscal Policies to Business Cycles	541
	Box 16.4: Anatomy of the Financial and Economic Crisis of 2007–2010	
	in the World Economy	542
	The policy responses	543
16.14	Inflation and Unemployment	543
16.15	Conclusions	545
	Key Concepts	545
	Summary of Critical Conclusions	546
	Review and Discussion Questions	546
	Advanced and Technical Questions	547
	Index	549